Improving forecast accuracy with the latest science

Over the first weekend in February our highly accurate forecasts of heavy snow and widespread ice enabled the country to prepare for the hazardous conditions.

At Heathrow Airport, for example, snow arrived within ten minutes of when Met Office forecasters had predicted - giving vital guidance for those managing the situation.

This level of forecasting accuracy is far from easy to achieve, however. Snow is an example of a small-scale weather feature, affected by a number of variables and notoriously difficult to forecast.

The Met Office is using cutting-edge developments to improve the accuracy of forecasts in these challenging situations which deal with so-called 'small scale' weather.

This includes things like intense rain showers or thunderstorms - which can be just a few hundred metres across, or weather which depends on fine details of the land surface, such as snow or valley fog.

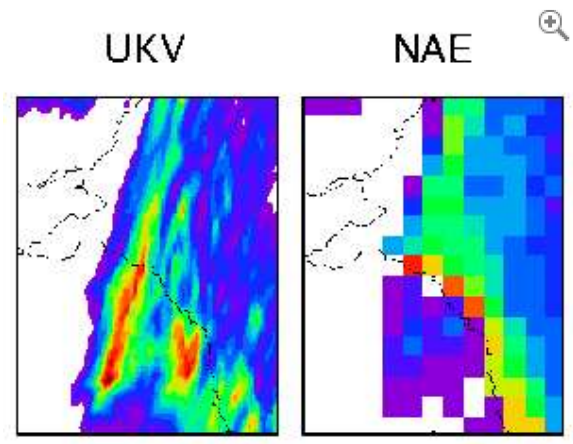
These types of weather can be very difficult to represent in forecasting models, which are the computer generated simulations of what the atmosphere - and weather - will do next.

Because the weather at a particular location is influenced by much larger scale weather patterns, models need to be run on a global scale even just to forecast for the UK.

Forecast models require a very large number of calculations and, with the computing power available, the global model the Met office runs uses a grid-scale of 25km (i.e. every grid-box is 25km x 25km).

At this resolution, large scale weather patterns will be well reproduced but the model will be unable to capture the detail of small scale weather. To tackle this, the Met Office has developed UKV.

This involves running a version of the model which focuses on the UK, allowing a much smaller 1.5km scale to be used. Information is fed in to the edges of UKV from the 25km global model.



24 hour accumulations for 25 Nov 2010 from UKV and 12 km models and radar (Select enlarge to see radar)

The 1.5km grid-boxes enable UKV to capture things like snow much better, leading to improved forecasts in many situations.

In most situations, even with a 1.5km grid, current science and technology does not enable the prediction of the exact location and timing of each shower that passes over the UK. However, the increased detail gives a better indication of the character of the weather and could be useful for giving probabilistic forecasts - which give the chances of, for example, rainfall in a given place at a given time.

We are continuing to look at ways of even further improving the accuracy and detail of our forecasts. You can find a more in-depth article about UKV in our Research News section.

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